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(54) BEVERAGE CASE

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ABSTRACT

BEVERAGE CASE

A single cell case is disclosed for carrying and storing bottles which can be stacked with other similar cases in a vertically aligned or a criss-cross manner in several different arrangements. The exterior bottom structure of the case has a plurality of longitudinal and transverse ribs defining a plurality of rectangular areas each of which has within it a polygonal bottle top recess having a bevelled peripheral edge defining a constricting area for the bottle tops in any of the criss-cross or aligned dispositions of the case with other similar cases. An interior bottom rib network is included which comprises a plurality of longitudinal ribs running parallel to the side walls between the end walls, a plurality of transverse ribs running parallel to the end walls between the side walls and a plurality of diagonal ribs running through the points of intersection of the longitudinal and transverse ribs.

The present invention relates to injection molded plastic open top single cell bottle or container storage and carrying cases and more particularly to such a case adapted to be stacked with other similar cases in both a vertically aligned as well as in several criss-cross relationships.

Some prior art plastic storage cases were made with circular concave recesses in the exterior bottom surface of the case underlying the center of each bottle contained in the case. These concave recesses would accommodate the bottle tops of an underlying case of bottles onto which a second similar case was stacked. When the cases containing bottles were 10 stacked in a vertically aligned manner, on top of one another, the bottle tops of a case in a lower tier would fit in the recesses of the bottom of the case in the next adjacent higher tier. Once these cases were so fitted together, the interaction of the recesses in the case bottom and the bottle tops served to lock together the cases to prevent their relative horizontal movement and thereby stabilize the stack.

However, because these recesses in the external surface of the bottom of the case were directly underneath the center of the bottles in the case, the cases could only be stacked in a vertically aligned manner. The cases could not be stacked in an offset, interlocking orientation because 20 the thickness of the case side walls prevented the tops of bottles on two side-by-side adjacent cases from fitting into the recesses on the external side of the bottom of a single upper tier case overlapping the side-by-side adjacent cases.

Other prior art cases were adapted for criss-cross

palletizing but generally only in one fixed pattern and were difficult to engage with and disengage from others in the stack, with frequent damage to the bottles contained therein.

According to one aspect of the present invention there is provided a unitary injection molded, plastic, single cell, half-depth, rectangular beverage case adapted for holding a plurality of beverage containers either individually or in multi-container carrying packs comprising: (a) a pair of side walls, (b) a pair of end walls integrally formed and interconnected with said side walls, and (c) a bottom integrally formed with and joined to said sidewalls and end walls to form an open top beverage case, (d) an inner bottom supporting network including a rectangular grid integrally formed with said bottom comprising: (1) a plurality of longitudinal ribs disposed substantially parallel to said sidewalls, (2) a plurality of transverse ribs disposed substantially parallel to said end walls and intersecting said longitudinal ribs, and (3) diagonal ribs extending across said bottom through such intersections to provide a plurality of triangular subdivisions of said network, (e) the exterior surface of said bottom including: (1) an integral rectangular grid structure aligned with the side and end walls defining a plurality of square sections, each said square section containing a recessed polygonal planar surface having a bevelled peripheral edge defining a constricting area for container tops on which said case is adapted for stacking on the containers of a similar case in a plurality of criss-cross palletizing arrangements.

In the accompanying drawings, which illustrate exemplary embodiments of the present invention:

Figure 1 is a side elevation of a beverage case according to the invention;

Figure 2 is an end elevation of the beverage case of Figure 1;

Figure 3 is a bottom plan view of one embodiment of the invention;

30 Figure 4 is a top plan view of the case of Figure 3;

- Fig. 5 is a side elevation in cross-section taken along lines 5-5 of Fig. 4;
- Fig. 6 is an end elevation in cross-section taken along lines 6-6 of Fig. 4;
5. Fig. 7 is a side elevation in cross-section of several cases according to the invention containing bottles and stacked in a criss-cross manner;
- Fig. 8 is a side view of several beverage cases according to the invention stacked in a criss-cross manner on a pallet;
10. Fig. 9 is a schematic plan view of beverage cases stacked on a pallet in a 6 x 6 criss-cross relationship;
- Fig. 10 is a side elevation of another embodiment having lifting ribs at the corners;
- Fig. 11 is an end elevation of the case of Fig. 10;
15. Fig. 12 is a top plan view of another embodiment of the invention;
- Fig. 13 is a bottom plan view of the case of Fig. 12;
- Fig. 14 is a section taken along lines 14-14 of Fig. 12;
- Fig. 15 is a section taken along lines 15-15 of Fig. 12;
20. Fig. 16 is a schematic plan view of cases stacked in a 7 x 7 criss-cross relationship; and
- Fig. 17 is a schematic plan view of cases stacked in an 8 x 8 criss-cross relationship.
- Referring now to the drawings, and in particular to
25. Figs. 1-6, beverage case 20 has side walls 21 and end walls 22 joined to bottom structure 23. Case 20 is of a size sufficient to accommodate for example twenty-four half liter bottles. Side walls 21 are of a height that is at least one half of the height of the bottles adapted to be contained in the case, leaving the
30. upper half and bottle top protruding out of the case (see Fig. 7).

Side walls 21 have external vertical stiffening ribs 24 and external horizontal stiffening ribs 25 to strengthen the case.

- As shown in Fig. 2, end walls 22 are joined to side walls 21 at the corners 26 and to the bottom 23 at edge 27. End walls 22 have the same height as side walls 21. End walls 22 have external vertical stiffening ribs 28 and external horizontal stiffening ribs 29 to strengthen the end wall and add rigidity to the case 20. End walls 22 each have an opening or hand hole 54 which provides manual lifting means for lifting and moving the case.

- The details of the case bottom 23 are shown in Fig. 3. The bottom structure 23 has a plurality of longitudinal ribs 30 on its outer surface 31 including a central longitudinal rib 32 parallel to the longitudinal axis or center line of the case and a pair of longitudinal ribs 30a and 30b on either side of the central longitudinal rib 32 and substantially parallel thereto. There are outboard longitudinal strengthening ribs 33 and 34 at the outboard edge 35 of bottom structure 23 as shown.

- Bottom 23 also includes a plurality of transverse ribs 36 on outer surface 31. There is a central transverse rib 37 aligned with the transverse center line of the case and additional parallel transverse ribs 37a, 37b, 37c, 37d, 37e and 37f disposed on either side of central transverse rib 37. The longitudinal and transverse ribs intersect to define a plurality of substantially rectangular areas 38 on exterior bottom surface 23.

The longitudinal and transverse ribs 30, 36, respectively, function to add rigidity and increase the structural strength of case 20, as well as to facilitate palletizing of the case as will be explained hereinafter.

- Each rectangular area 38 contains a bottle top receiving

recess 39 which is a planar depression in said bottom 23 and defined at its periphery by a bevelled polygonal edge 40. Recess 39 is of sufficient size to contact and confine along at least a portion of its periphery a bottle top having a standard 5. size crown in one of several positions when one case is stacked upon the tops of bottles contained in another similar half-depth bottle case.

Recesses 39 contained in rectangular areas 38 immediately adjacent the central transverse rib 37, have a generally 10. rectangular configuration with rounded corners 41. Said recesses are disposed substantially equidistant from adjacent transverse ribs 36 and adjacent longitudinal ribs 30a, 30b.

The recesses 39 not immediately adjacent the transverse rib 37 along the transverse center line of the case have a right 15. rectangular pentagonal configuration as shown, with rounded corners 42. The recesses 39 contained in each quadrant not immediately adjacent central transverse rib 37 are disposed adjacent the respective outboard longitudinal rib and the respective outboard transverse rib as shown in Fig. 3.

20. The recesses 39 having a right rectangular pentagonal configuration are disposed so that their apices 43 are pointed inwardly toward the central transverse rib 37 along the transverse center line of the case.

Bottom structure 23 contains a plurality of drainholes 25. 44 in each rectangle defined by the longitudinal and transverse ribs. These drainholes 44 allow any liquid to drain from case 20 that accumulates from any broken bottles or otherwise.

On the outer surface 31 of bottom structure 23, diagonal ribs 45 radiate for a limited distance from the points of 30. intersection 46 of the longitudinal and transverse ribs. Ribs

45 are focused radially inwardly toward each recess 39 and are adapted to provide a sliding surface to assist in engaging and disengaging bottle tops sliding into or out of each recess 39 during stacking and removal, as does bevelled edge 40.

5. Case 20 has an interior bottom rib network 47 as shown in Fig. 4. Bottom rib network 47 has a plurality of longitudinal ribs 48 extending between end walls 22 and a plurality of transverse ribs 49 extending between side walls 21. A plurality of diagonal ribs 50 run through the points of intersection 51 of longitudinal ribs 48 and transverse ribs 49 and define a triangular grid throughout the interior bottom of the case.
10. 15. 20. 25. 30.

The longitudinal, transverse and diagonal ribs that make up the bottom rib network 47 are adapted to engage and support the bottom of beverage containers, e.g., six packs 52 of the like (see Fig. 7). As shown in Fig. 4, there is at least one drain-hole 44 for each triangular area 53.

- As shown in Figs. 4 and 6, end walls 22 are each provided with a generally rectangular hand hole 54, and below each hand hole and projecting inwardly from the interior 55 of end wall 22 is a generally rectangular boss 56 (see Fig. 4) with a consequent recess 57 being provided on the exterior surface 58 of end wall 22 (see also Fig. 5). Also provided on end interior surface 55, on either side of boss 56 are vertical stabilizing ribs 59 which, together with boss 56 provide stabilizing contact for six packs 52 or other removable container means contained within case 20 in use. Ribs 59 may be extensions of corresponding longitudinal ribs 48.

- The beverage case of the present invention is manufactured by injection molding from suitable high impact plastic such as styrene, polyethylene, polypropylene, etc., and the structure,

such as shown in Figs. 1-6, is of unitary one-piece construction which provides a half-depth open top beverage case of light weight, durable and long life.

A plurality of beverage cases 20 stacked in a criss-cross manner are shown in Fig. 7. In lower tier 60, two cases 20a and 20b are stacked end-to-end with the end wall 22a of case 20a abutting end wall 22b of case 20b. A case 20c is stacked in straddling fashion on top of the bottles 61a in case 20a and bottles 61b in case 20b. Bottle tops 62a and 62b of bottles 61a and 61b, respectively, fit in the recesses 39c of the case 20c. Thus, the interaction of recesses 39c and bottle tops 62a and 62b prevent relative horizontal movement between cases 20c, 20a and 20b.

Case 20 can be stacked in a criss-cross manner because of the position and shape of recesses 39. The distance between top 62b and 62a is greater than between two adjacent bottle tops 62a because of the width of the abutting horizontal reinforcing ribs 63a and 63b. Because of the abutting reinforcing ribs 63a and 63b, a case having circular recesses to accommodate bottle tops immediately underlying the bottle in the case could not be stacked in a criss-cross manner because the tops of the bottles in the underlying tier of cases would not fit in the recesses under the case straddling two lower cases.

An example of cases 20 of the present invention palletized in a 6 x 6 criss-cross manner is shown in Figs. 8 and 9.

A plan schematic view of the palletized stack shown in Fig. 8 is shown in Fig. 9. The dotted lines in Fig. 9 show six cases 20 on a first tier 64 stacked two abreast and three deep on a conventional 40" x 48" pallet 65. The solid lines depict an upper tier 66 of cases three abreast and two deep. When stacked

in this manner, the cases are substantially interlocked and cannot tip over to cause damage as with a vertically aligned stack of cases which would not be so interlocked and stabilized.

The embodiment of the invention shown in Figures 1-7 is particularly adapted for use with 24 one-half liter Shasta bottles, either placed individually in the case or in six or eight packs. The particular configuration of recesses 39 permits aligned vertical stacking or palletizing, or more preferably 6 x 6 criss-cross stacking.

Referring now to Figures 10-15, another embodiment of the invention
10 is shown which is particularly adapted to contain four six bottle packs or three eight bottle packs of 16 ounce bottles of, for example, soft drinks or, with minor overall dimensional changes, the same number of packages of one-half liter bottles. The principles and materials of construction are essentially the same as for the prior described embodiment, one of the chief differences being the shape of the bottom polygonal recesses 39 and their disposition relative to the longitudinal and transverse ribs 30, 37 respectively. Other additional features will be described below.

As shown in Figures 10 and 11, side walls 21 and end walls 22 are substantially identical with the case depicted in Figures 1-6 with one
20 notable exception. At the four corners 67 of case 20, and extending there-around are a plurality of substantially parallel lifting ribs or flanges 68 disposed in spaced vertical relation with one another and bottom rim 69 and coextensive with the latter in distance of projection outwardly from side wall 21 and end wall 22. These flanges or ribs 68 facilitate de-stacking by coming into contact with roller means on a spring mounted platform (not shown) whereby the contacted case is lifted or

tilted upwardly to permit the arms of a forklift truck to slide under the case for removal from the pallet.

- The outer surface 31 of case bottom 23 is shown in Fig. 13. Longitudinal and transverse ribs 30, 37 divide the
5. bottom into a plurality of similar rectangular areas 38. Disposed within areas 38 are polygonal recesses 39 which are of irregular hexagonal shape with bevelled edges 40. Drainage holes 44 are also provided in bottom 23 and radially extending diagonal ribs 45 are provided at intersections 46.
10. The irregular hexagonal recesses 39 permit 6 x 6, 7 x 7 and 8 x 8 stacking of 24 sixteen ounce or half-liter bottles. 7 x 7 stacking is shown schematically in Fig. 16 and 8 x 8 stacking is shown schematically in Fig. 17.

- As shown in Fig. 12, an interior bottom rib network 47 is provided which is substantially identical with that of the embodiment first discussed in connection with Figs. 1-6. Longitudinal, transverse and diagonal ribs 48, 49, 50 respectively divided the interior bottom of the case 20 into a plurality of triangular areas 53, each with at least one drainhole 44.

20. Hand holes 54 are provided in end walls 22 and stabilizing bosses 56 and vertical stabilizing ribs 59 are likewise included.

- As shown in Fig. 14, pairs of vertical stabilizing ribs 70 are provided on inner surface 71 of side walls 21, each pair straddling a respective one of said transverse ribs 49 (see also 25. Fig. 12). These ribs 70 are particularly adapted to prevent breakage of individual empty bottles when being returned in said case 20 for recycling.

- While specific dimensions of cases constructed in accordance with the herein described invention may vary as desired, 30. it is usually preferable to have a length to width ratio of

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3 to 2, and the other design parameters adjusted so that the cases can be appropriately stacked on a standard 40" x 48" pallet.

5. While certain embodiments of the invention have been shown and described herein, it is to be understood that other changes and additions may be made by those skilled in this art without departing from the scope and spirit of the invention.

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WHAT IS CLAIMED IS:

1. A unitary injection molded, plastic, single cell, half-depth, rectangular beverage case adapted for holding a plurality of beverage containers either individually or in multi-container carrying packs comprising:

(a) a pair of side walls,

(b) a pair of end walls integrally formed and interconnected with said side walls, and

(c) a bottom integrally formed with and joined to said sidewalls and end walls to form an open top beverage case,

(d) an inner bottom supporting network including a rectangular grid integrally formed with said bottom comprising:

(1) a plurality of longitudinal ribs disposed substantially parallel to said sidewalls,

(2) a plurality of transverse ribs disposed substantially parallel to said end walls and intersecting said longitudinal ribs, and

(3) diagonal ribs extending across said bottom through such intersections to provide a plurality of triangular subdivisions of said network,

(e) the exterior surface of said bottom including:

(1) an integral rectangular grid structure aligned with the side and end walls defining a plurality of square sections, each said square section containing a recessed polygonal planar surface having a bevelled peripheral edge defining a constricting area for container tops on which said case is adapted for stacking on the containers of a similar case in a plurality of criss-cross palletizing arrangements.

2. In a case according to claim 1, at least one drainage hole means in said bottom disposed within each of said triangular subdivisions.
3. In a case according to claim 1, the interior surface of each said sidewall being provided with integrally formed pairs of vertical container stabilizing ribs, each pair straddling a respective one of said transverse ribs.
4. In a case according to claim 3, an inwardly projecting rectangular boss formed and centrally disposed in each said end wall, and said longitudinal ribs adjacent said sidewalls extending upwardly along the interior surfaces of said end walls intermediate said bosses and said sidewalls.

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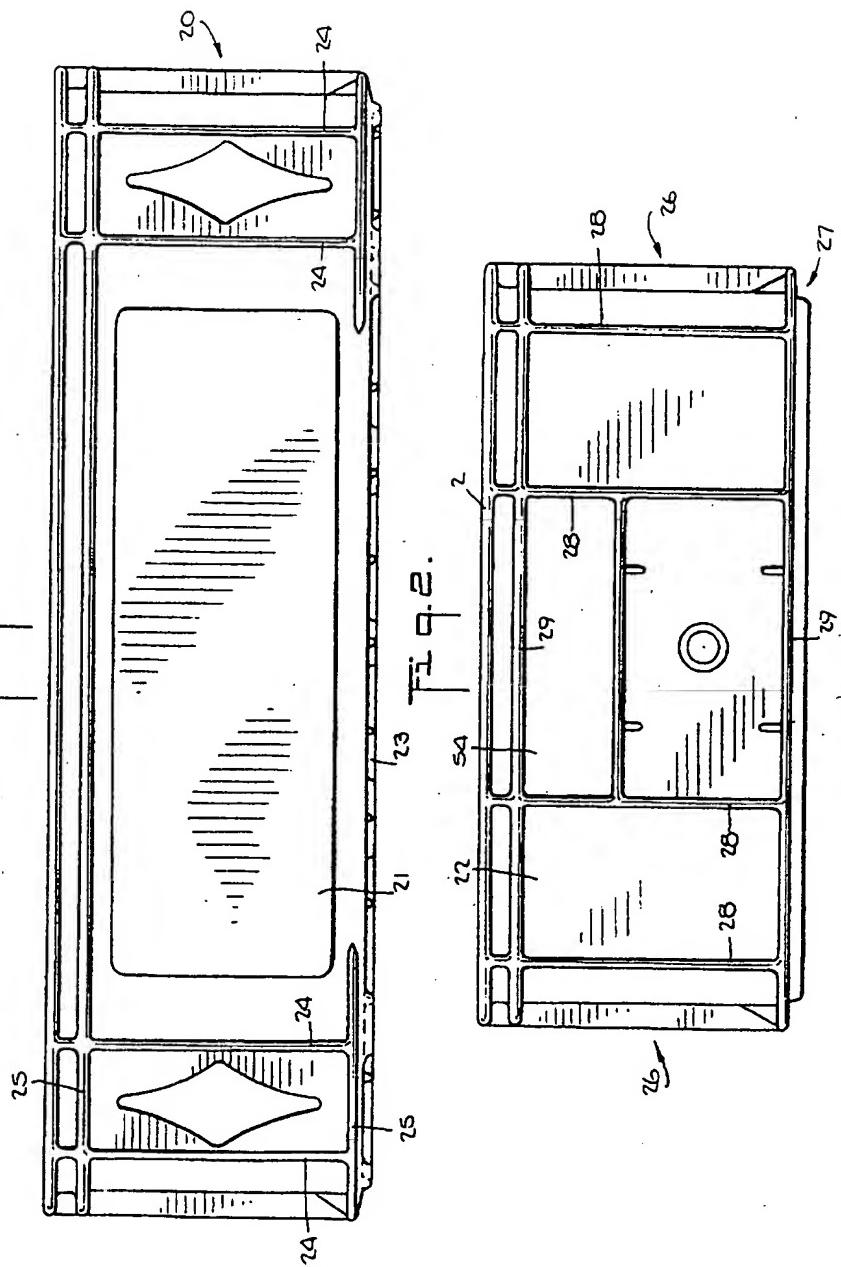
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Fig. 2.

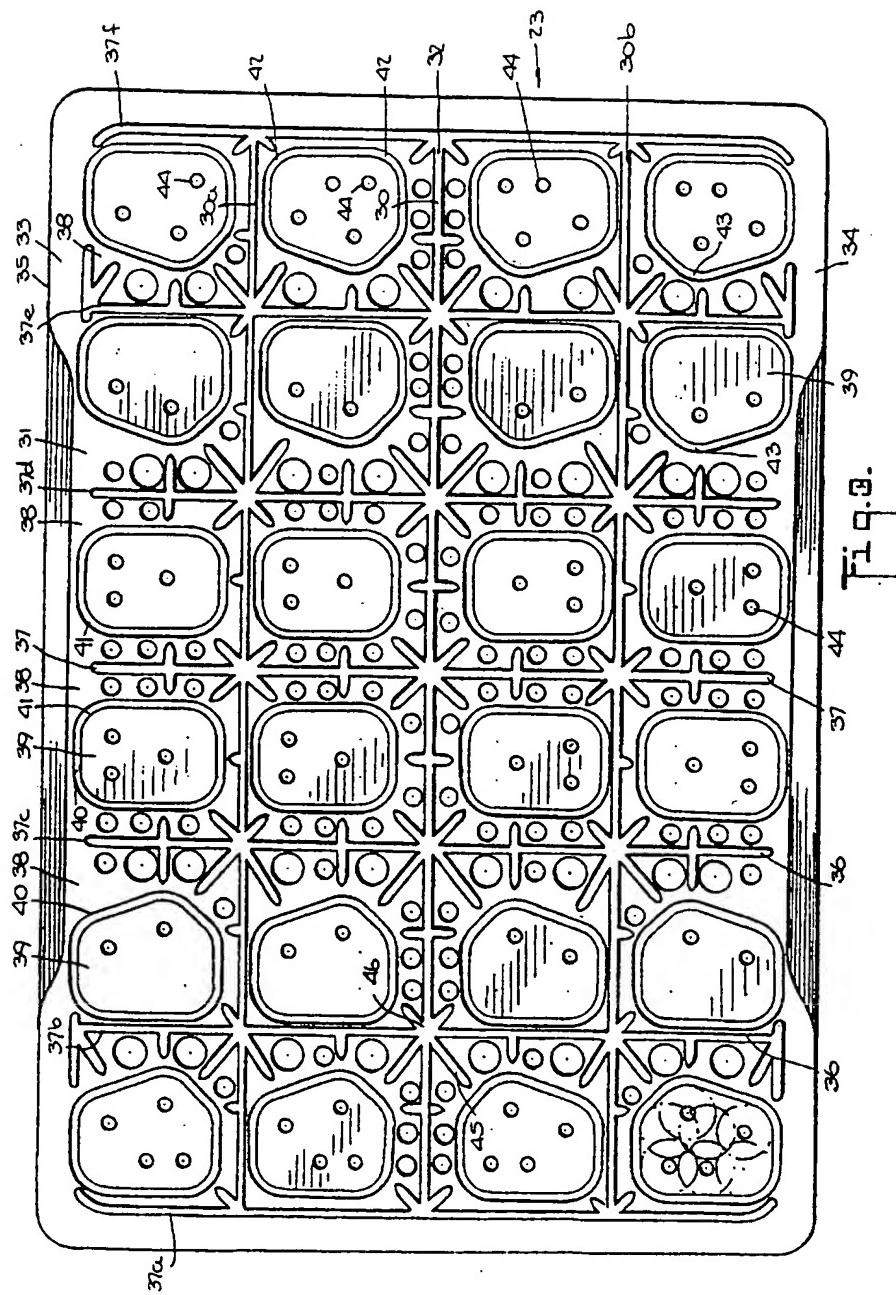


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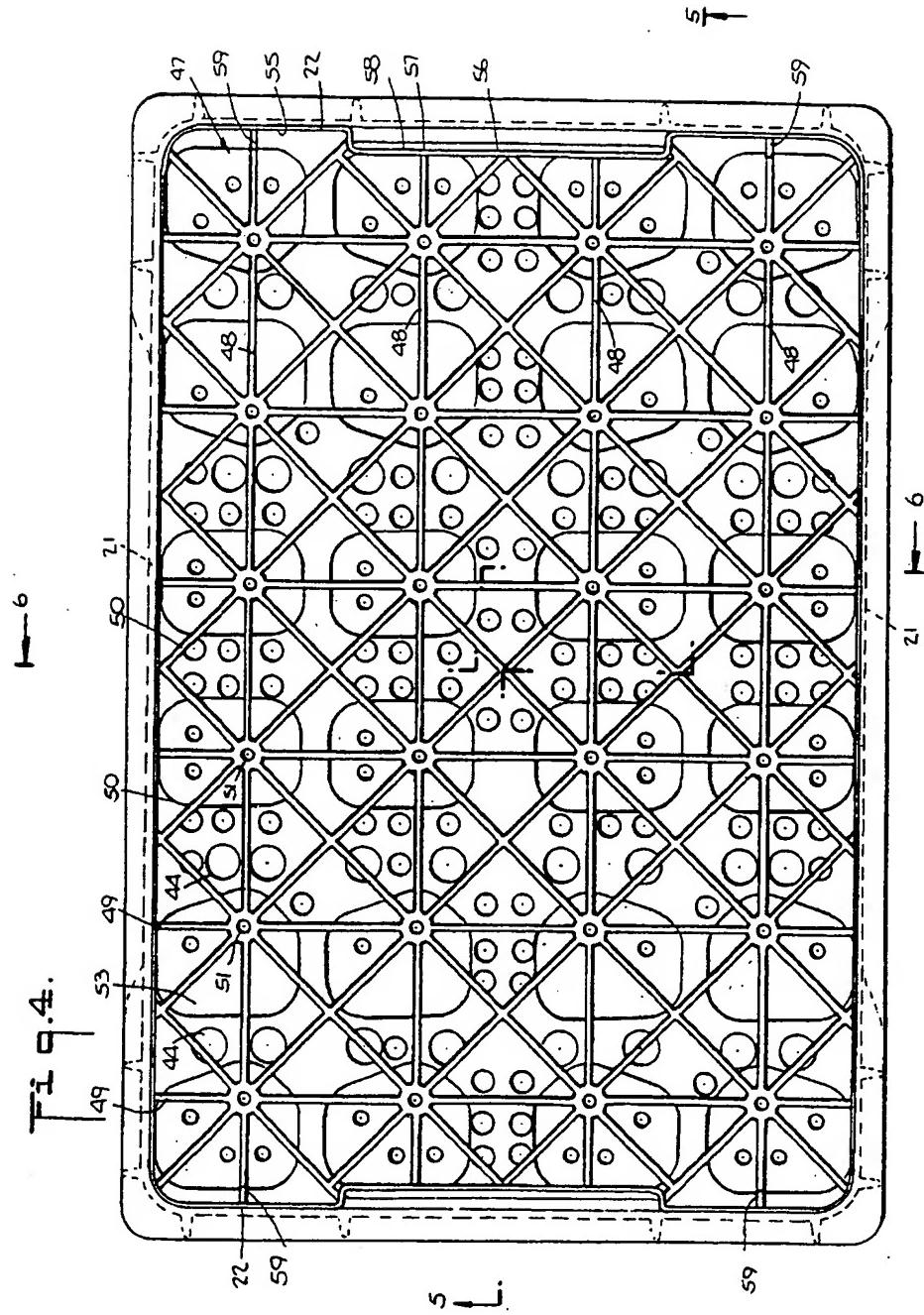
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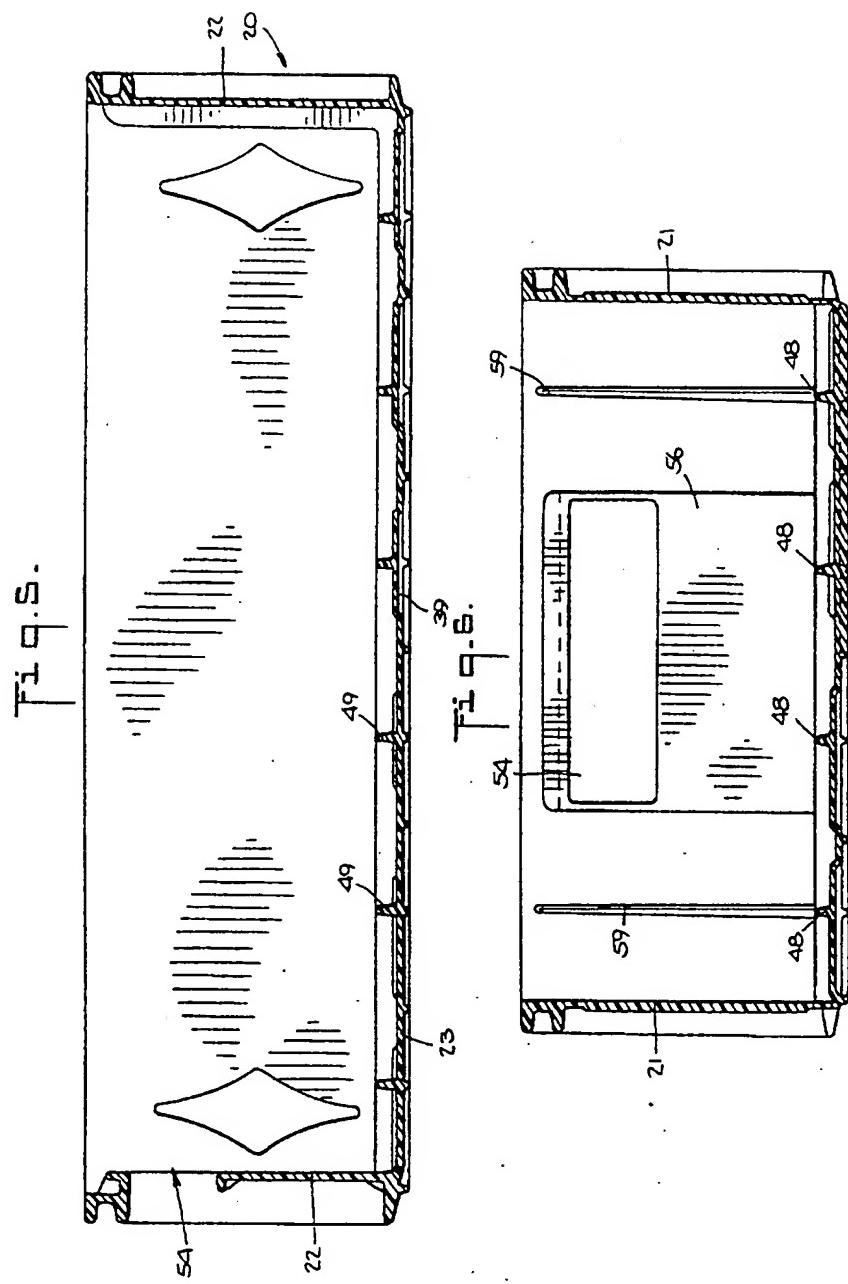
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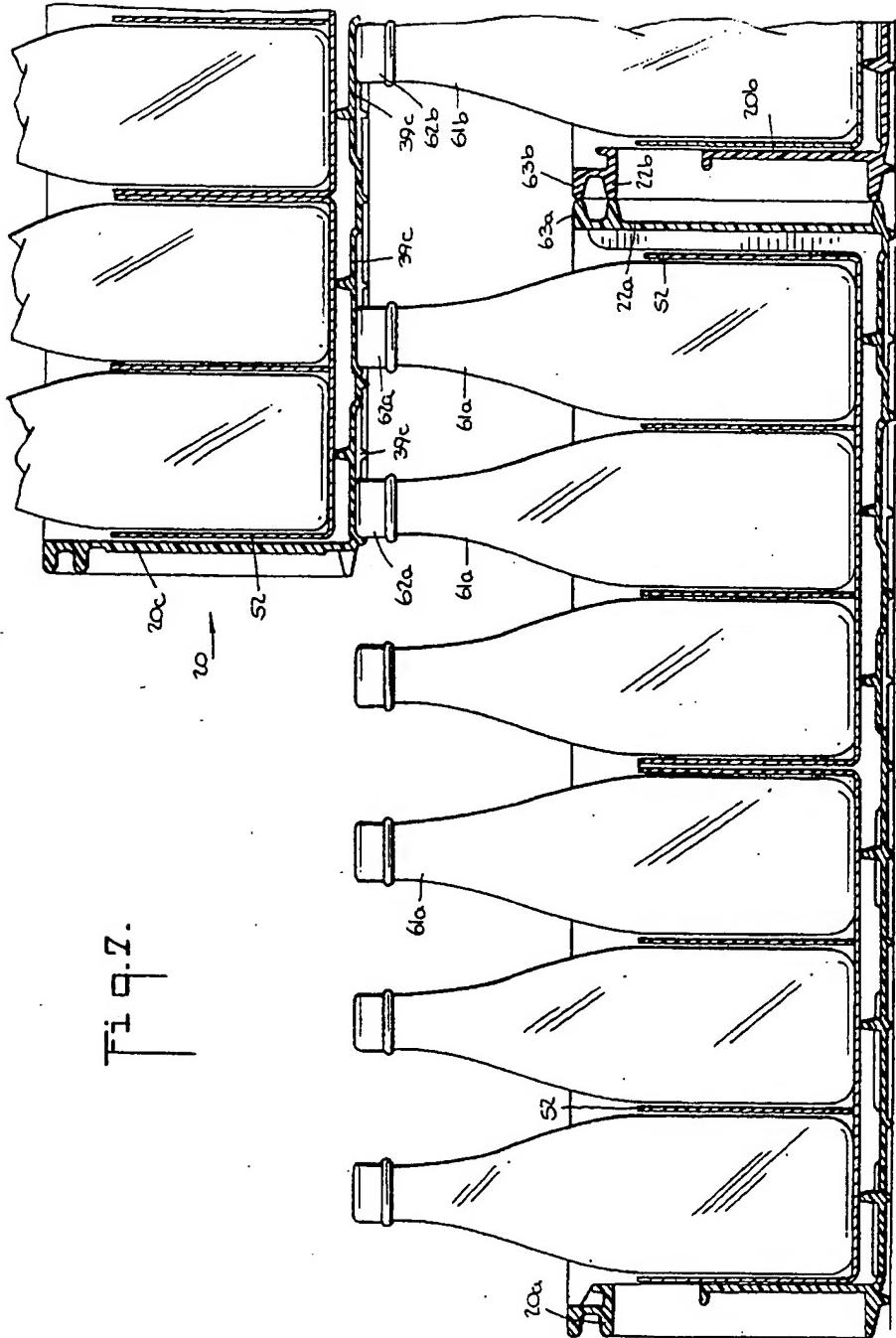


Fig. 2.

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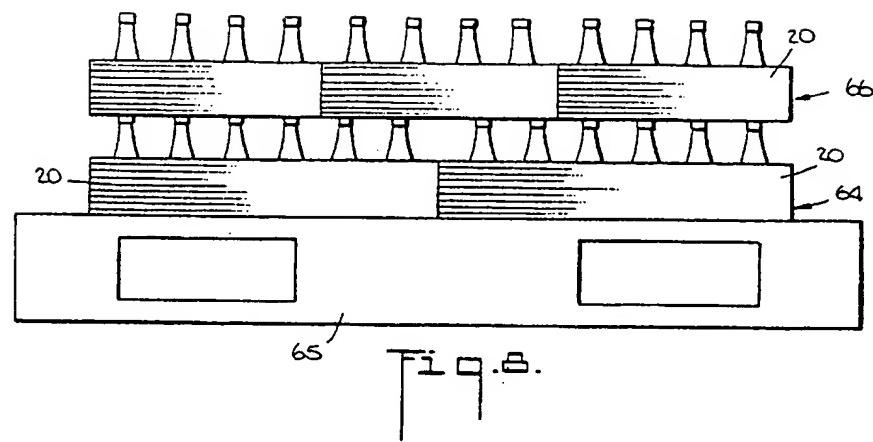


Fig. 8.

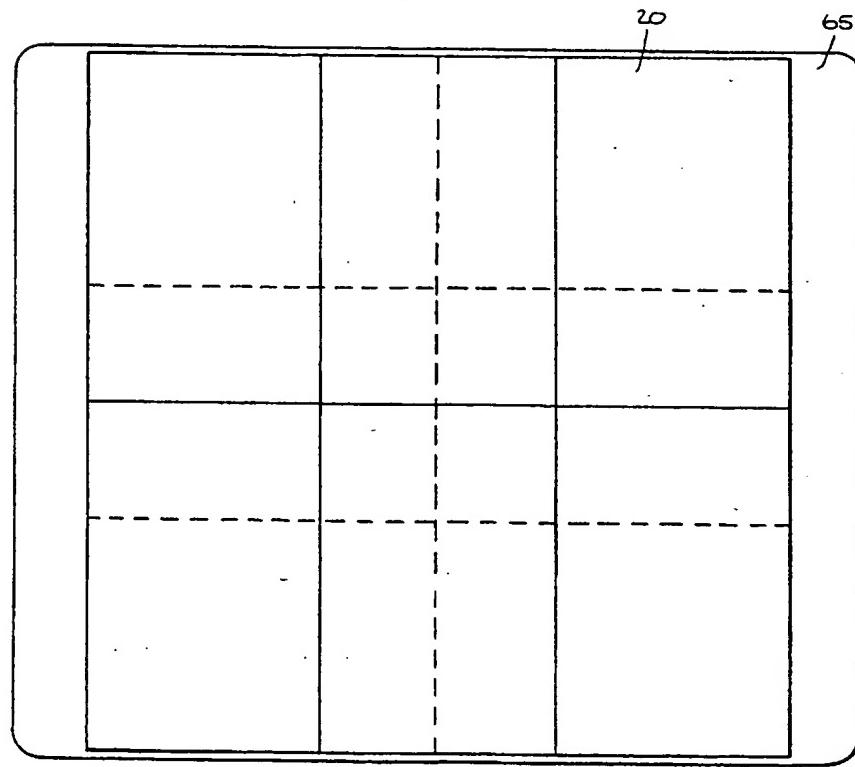
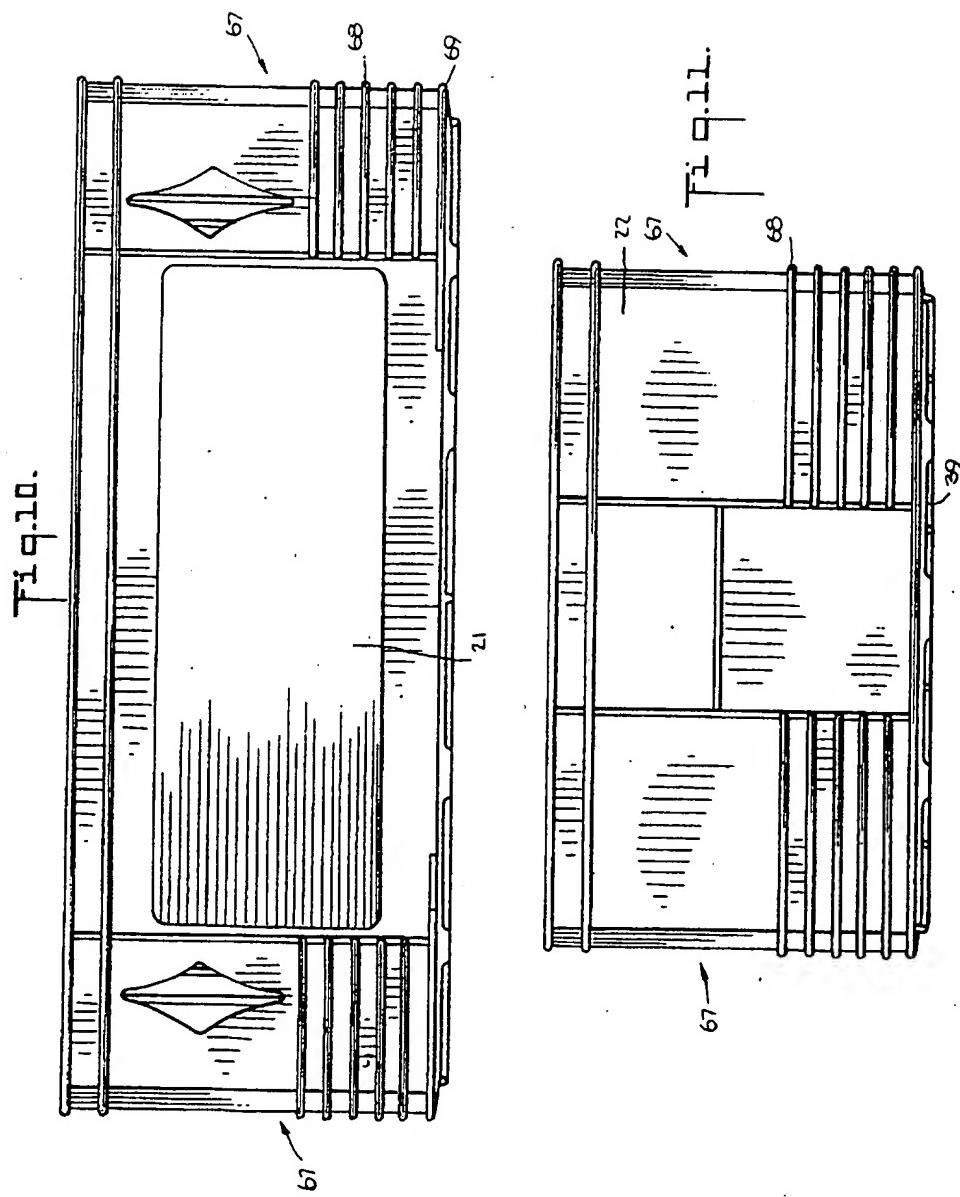


Fig. 9.

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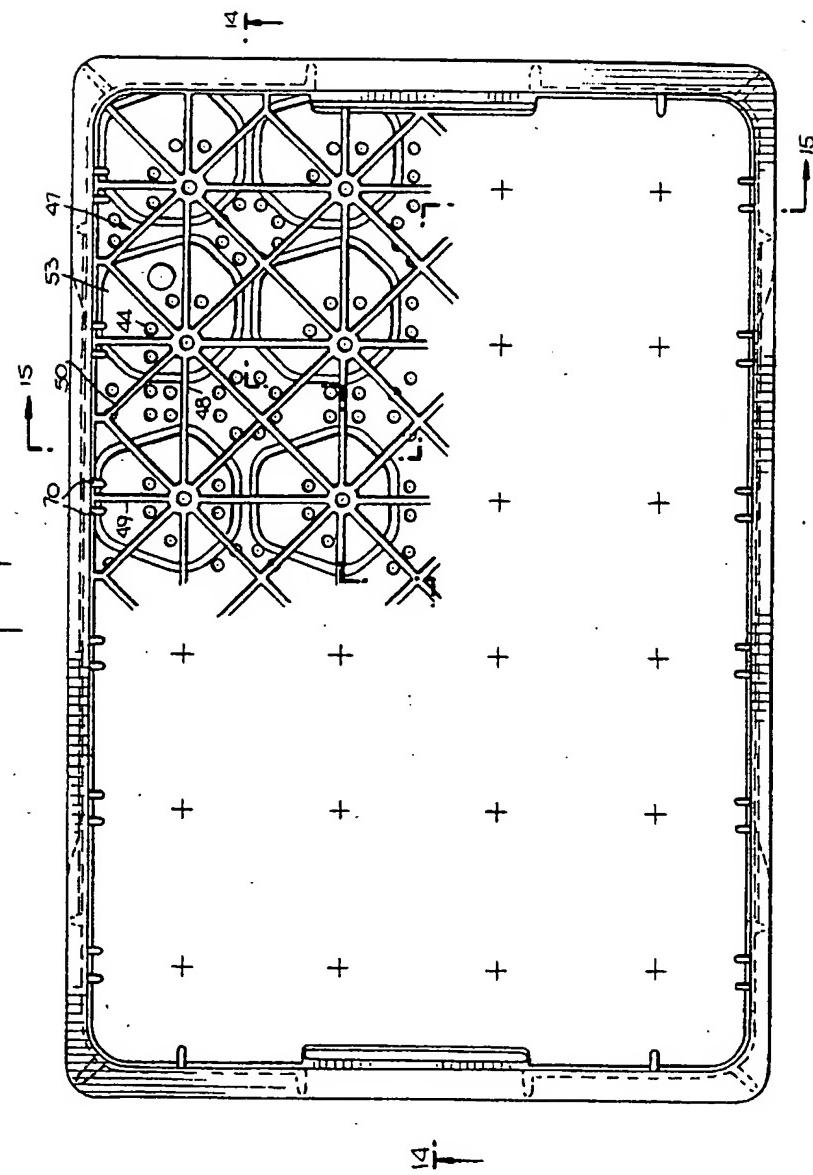


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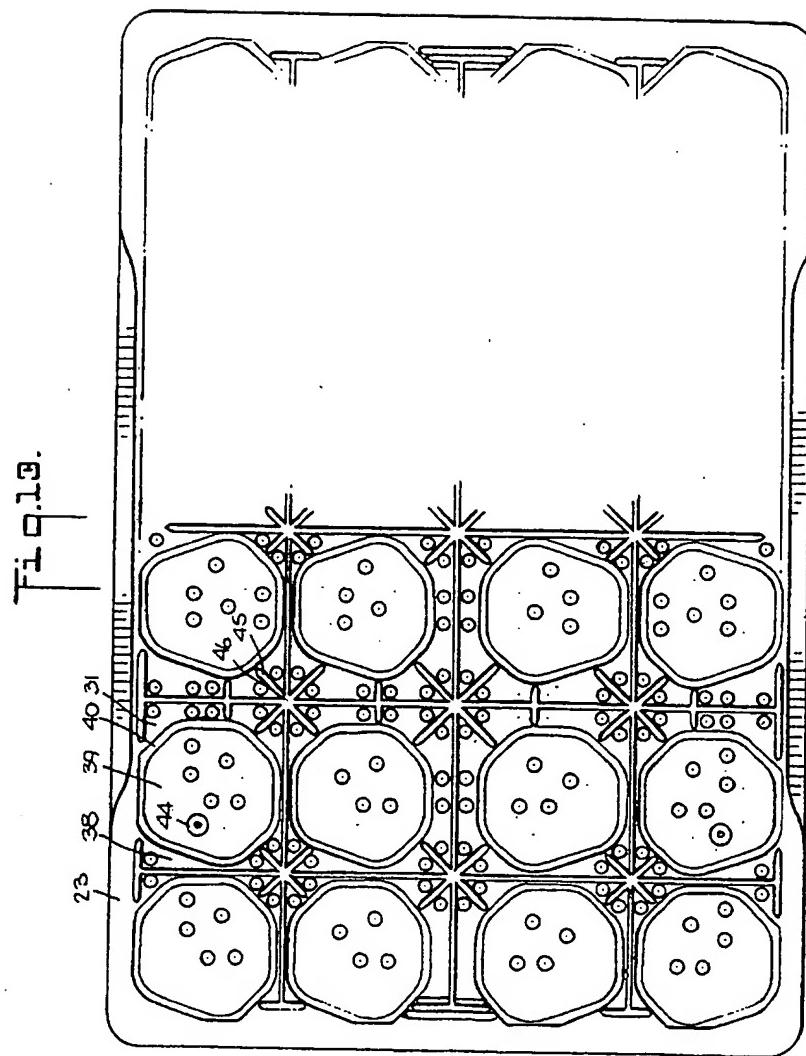
Fig. 12.



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Fig.14.

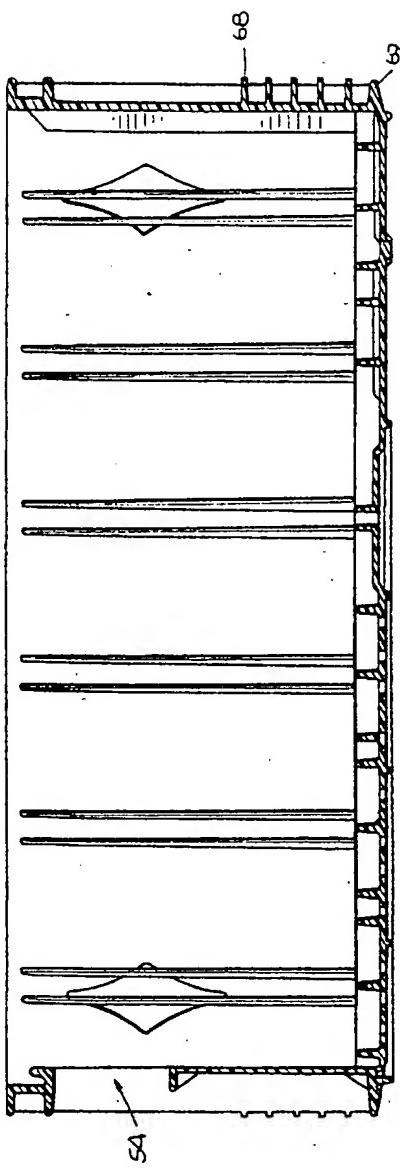
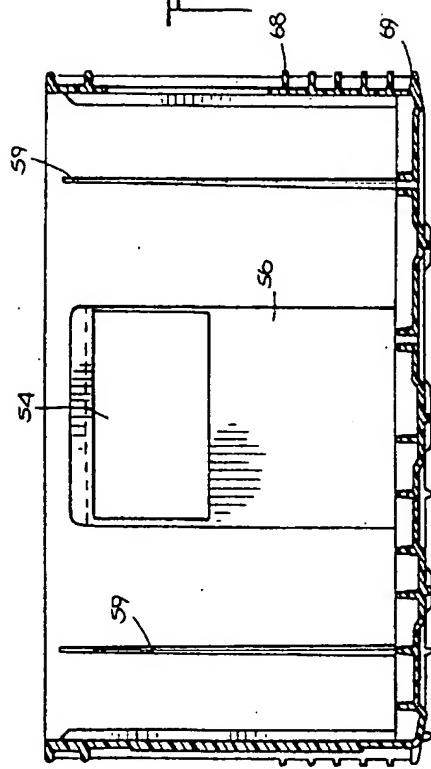


Fig.15.



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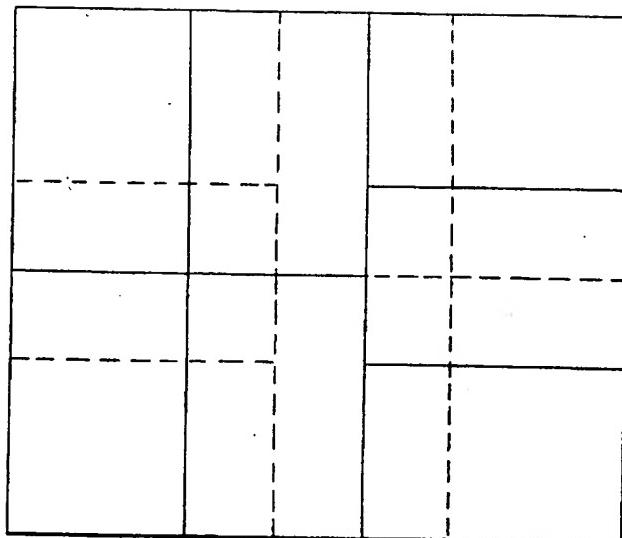
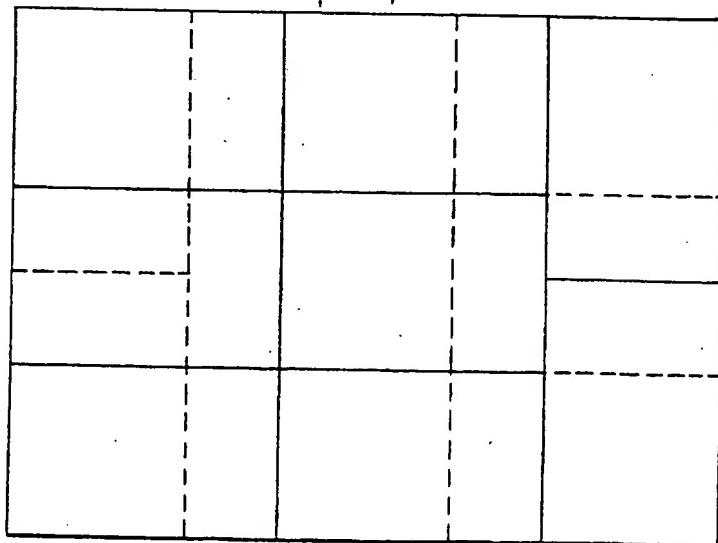


Fig.16.

Fig.17.



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